

FORM PTO-1390 U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICE (REV. 1094)

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET  
NUMBER

C1043/7032

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/857698

INTERNATIONAL APPLICATION NO.  
PCT/GB99/04050

INTERNATIONAL FILING DATE  
7 December 1999 (07.12.99)

PRIORITY DATE CLAIMED  
08 December 1998 (08.12.98)

TITLE OF INVENTION  
DISPLAY DEVICES

APPLICANT(S) FOR DO/EO/US

BERGER, Paul; BURROUGHES, Jeremy Henley; CARTER, Julian Charles; HEEKS, Stephen Karl

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:


1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
  - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(C)(5)).

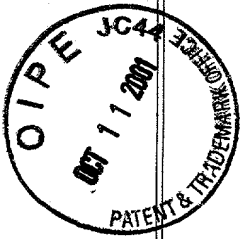
**Items 11. To 16. Below concern document(s) or information included:**

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment (with amended claims).
  - ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. ☐ A substitute specification (submitted as a first Preliminary Amendment).
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:
  - Mailed via Express Mailing Label No. EL711250241US
  - Published Application with Search Report
  - Post Card

Mailing Date: June 8, 2001

Express Mail Label No. EL711250241US

U.S. APPLICATION NO (if known, see 37 CFR 1.5) <b>09/857698</b>		INTERNATIONAL APPLICATION PCT/GB99/04050		ATTORNEY'S DOCKET NUMBER C1043/7032	
17. <input checked="" type="checkbox"/> The following fees are submitted:				CALCULATIONS <small>PTO USE ONLY</small>	
<b>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):</b>					
Search Report has been prepared by the EPO or JPO ..... \$860.00					
International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... \$690.00					
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).. \$760.00					
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... \$1000.00					
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) \$100.00					
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>				\$ 860.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than ~ 20 X 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	35 - 20 =	15	X \$18.00	\$ 270.00	
Independent Claims	3 - 3 =	0	X \$80.00	\$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$260.00	\$	
<b>TOTAL OF ABOVE CALCULATIONS =</b>				\$1130.00	
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).				\$	
<b>SUBTOTAL =</b>				\$1130.00	
Processing fee of \$130.00 for furnishing the English translation later than ~ 20 ~ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
<b>TOTAL NATIONAL FEE =</b>				\$1130.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate coversheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	
<b>TOTAL FEES ENCLOSED =</b>				\$1130.00	
				Amount to be:	
				refunded \$	
				charged \$	
a. <input checked="" type="checkbox"/> A check in the amount of \$1130.00 to cover the above fees is enclosed.					
b. Please charge by Deposit Account No. _____ In the amount of \$ _____ To cover the above fees. A duplicate copy of this sheet is enclosed.					
c. <input checked="" type="checkbox"/> The commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 23/2825. A duplicate of this sheet is enclosed.					
<b>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status.</b>					
SEND ALL CORRESPONDENCE TO				SIGNATURE	
Therese A. Hendricks WOLF, GREENFIELD & SACKS, P.C. 600 Atlantic Avenue Boston, Massachusetts 02210					
<b>CUSTOMER NO. 23628</b>				NAME	
				Therese A. Hendricks	
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				REGISTRATION NO	



PATENT  
Customer No. 22,852  
Attorney Docket No. 08513.7032-00000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: )  
Berger et al. ) Group Art Unit: unknown  
Serial No.: 09/857,698 ) Examiner: unknown  
Filed: June 8, 2001 )  
For: DISPLAY DEVICES )

Assistant Commissioner for Patents  
Washington, DC 20231

**PRELIMINARY AMENDMENT**

Prior to the examination of the above application, please amend this application  
as follows:

**IN THE SPECIFICATION:**

On page 1, after the title and before the first paragraph, please add the following:

**Related Applications**

This application is a national stage filing of PCT/GB99/04050 having an  
international filing date of 7 December 1999, which claims priority on GB 9827014.3  
filed 8 December 1998 and GB 9901334.4 filed 21 January 1999.

**Background of the Invention**

On page 2, before the first paragraph please add the subheading -- Summary of the Invention --;

On page 7, before the third full paragraph, please add the subheading -- Brief Description of the Drawings;

On page 7, before the last paragraph, please add the subheading -- Detailed Description --


**REMARKS**

If there is any fee due in connection with the filing of this Preliminary Amendment, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: October 9, 2001

By:   
Therese A. Hendricks  
Reg. No. 30,389

LAW OFFICES

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ATTORNEY'S DOCKET NO: C1043/7032

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Paul Berger et al.  
Serial No: --  
Filed: Herewith  
For: DISPLAY DEVICES

Assistant Commissioner for Patents  
Washington, D.C. 20231

## PRELIMINARY AMENDMENT

Please amend the above application as follows to conform the specification with U.S. practice.

### In The Specification

On page 8, line 18, please delete the symbol “\*/Ø” and substitute the following symbol “Ω / □”

### In the Abstract

Please add the following Abstract (also attached on a separate sheet at the end of this preliminary amendment):

-- A light-emissive device comprising: a light-emissive region (12); a first electrode (10) located on a viewing side of the light-emissive region for injecting charge carriers of a first type; and a second-electrode (11) located on a non-viewing side of the light-emissive region for injecting charge carriers of a second type; and wherein there is a reflectivity-influencing structure (13) located on the non-viewing side of the light-emissive region and including a light absorbent layer comprising graphite and/or a fluoride or oxide of a low work function metal. --

## In The Claims

Please delete claim 36.

Please rewrite the claims as shown.

1. A light-emissive device comprising:
  - a light-emissive region;
  - a first electrode located on a viewing side of the light-emissive region for injecting charge carriers of a first type; and
  - a second electrode located on a non-viewing side of the light-emissive region for injecting charge carriers of a second type;
  - and wherein there is a reflectivity-influencing structure located on the non-viewing side of the light-emissive region and including a light absorbent layer comprising graphite and/or a fluoride or oxide of a low work function metal.
2. A light-emissive device as claimed in claim 1, wherein the first electrode is at least partially light-transmissive.
3. (amended) A light-emissive device as claimed in claim 1, wherein the reflectivity influencing structure is located on the opposite side of the second electrode from the light-emissive region.
4. A light-emissive device as claimed in claim 3, wherein the second electrode is at least partially light-transmissive.
5. (amended) A light-emissive device as claimed in claim 3, wherein the thickness of the second electrode is less than 30nm.
6. (amended) A light-emissive device as claimed in claim 3, wherein the reflectivity-influencing structure is adjacent the second electrode.

7. (amended) A light-emissive device as claimed in claim 1, wherein the second electrode provides the reflectivity-influencing structure.

8. A light-emissive device as claimed in claim 7, wherein the second electrode comprises a fluoride or oxide of a low work function metal.

9. A light-emissive device as claimed in claim 8, wherein the second electrode comprises aluminium.

10. (amended) A light-emissive device as claimed in claim 1, wherein the reflectivity-influencing structure is effective to absorb light emitted from the light-emissive region that reaches it through the second electrode and/or incident light.

11. (amended) A light-emissive device as claimed in claim 7, wherein the presence of the reflectivity-influencing structure adjacent the second electrode renders the second electrode substantially non-reflective to light emitted from the light-emissive region and/or incident light.

12. (amended) A light-emissive device as claimed in claim 1, wherein the second electrode comprises an electrically conductive material.

13. (amended) A light-emissive device as claimed in claim 1, wherein the light-emissive layer comprises an organic light-emissive material.

14. (amended) A light-emissive device as claimed in claim 1, wherein the light-emissive layer comprises a polymer light-emissive material.

15. (amended) A light-emissive device as claimed in claim 1, wherein the light-emissive layer comprises a conjugated polymer material.

16. (amended) A light-emissive device as claimed in claim 1, wherein the reflection-influencing layer is electrically conductive.

17. A light-emissive device comprising:

a light-emissive region;

a first electrode located on a viewing side of the light-emissive region for injecting charge carriers of a first type; and

a second electrode located on a non-viewing side of the light-emissive region for injecting charge carriers of a second type;

and wherein there is a reflectivity-influencing structure located on the non-viewing side of the light-emissive region and including a light-reflective layer and a light-transmissive spacing layer between the second electrode and the light-reflective layer, the thickness of the spacing layer being such as to space a reflective plane of the light-reflective layer by approximately half the wavelength of the optical mode of the device from at least part of the light-emissive region.

18. A light-emissive device as claimed in claim 17, wherein the said part of the light-emissive region is a part at which, when the device is in operation, there is significant electron/hole recombination.

19. (amended) A light-emissive device as claimed in claim 18, wherein the said part of the light-emissive region is a principal region for electron/hole recombination.

20. (amended) A light-emissive device as claimed in claim 17, wherein the said plane of the light-reflective layer is the major surface of the light-reflective layer that is closer to the light-emissive region.



21. (amended) A light-emissive device as claimed in claim 17, wherein the second electrode comprises an electrically conductive material.

22. (amended) A light-emissive device as claimed in claim 17, wherein the light-emissive layer comprises an organic light-emissive material.

23. (amended) A light-emissive device as claimed in claim 17, wherein the light-emissive layer comprises a polymer light-emissive material.

24. (amended) A light-emissive device as claimed in claim 17, wherein the light-emissive layer comprises a conjugated polymer material.

25. (amended) A light-emissive device as claimed in claim 17, wherein the reflection-influencing layer is electrically conductive.

26. A light-emissive device comprising:  
a light-emissive region;  
a first electrode located on a viewing side of the light-emissive region for injecting charge carriers of a first type; and  
a second electrode located on a non-viewing side of the light-emissive region for injecting charge carriers of a second type;  
and a contrast enhancing structure located on the non-viewing side of the light-emissive region and including a reflective structure having different reflectivity for different wavelengths of incident light, and having a reflectivity peak encompassing an emission wavelength of the light-emissive region.

27. A light-emissive device as claimed in claim 26, wherein the reflective structure is a distributed Bragg reflector.

28. (amended) A light-emissive device as claimed in claim 26, wherein the second electrode comprises a layer located on the non-viewing side of the reflective structure and a plurality of through paths passing through the reflective structure for electrical conduction between the said layer of the second electrode and the light-emissive region.

29. A light-emissive device as claimed in claim 28, wherein the through paths occupy less than 15% of the emissive area of the device.

30. (amended) A light-emissive device as claimed in claim 26, wherein the cathode comprises a transparent layer located between the reflective structure and the light-emissive region.

31. (amended) A light-emissive device as claimed in claim 30, wherein the transparent layer is in contact with the through paths.

32. (amended) A light-emissive device as claimed in claim 26, wherein the second electrode comprises an electrically conductive material.

33. (amended) A light-emissive device as claimed in claim 26, wherein the light-emissive layer comprises an organic light-emissive material.

34. (amended) A light-emissive device as claimed in claim 26, wherein the light-emissive layer comprises a polymer light-emissive material.